

CHAPTER 6

Recommendations

Eight water source options were identified and discussed in **Chapter 5** that provide opportunities to address the water supply issues in the Upper East Coast (UEC) Planning Area.

- Aquifer storage and recovery
- Conservation
- Floridan Aquifer
- Reclaimed Water
- Reservoirs
- Seawater
- Surface water
- Surficial Aquifer

The water source options were reviewed to assess their potential of meeting the water supply needs of the region (**Table 21**). **Table 21** indicates the ability of options to meet identified needs, except for inland environmental needs. For inland environmental needs, the response shows the ability of that option to offset demands, primarily from the Surficial Aquifer System (SAS), thereby reducing demand and potentially enhancing nearby natural systems. The relative ability of each source option in this table was based on regional volumes (supply and demand), and does not in all cases reflect the public's sense of importance of that option. For example, significant emphasis was placed on the importance of conservation and the furthering of a conservation ethic, although from a regional perspective, and compared to other water source options; the volume of water that could be made available through conservation is low to medium. At the local level, the potential of each option may change based on the specific needs of that local situation. Elements of conservation are incorporated with the use of each of these options.

In **Table 21**, an entry of high (H) indicates the option, based on volume, has a high potential to address the associated category's water supply needs. A medium (M) entry indicates the option has a medium potential and a low (L) entry means there is low potential to address water supply needs. The high, medium and low entries are relative to one another. These options serve as a menu that local water users should consider in meeting their water needs. In many cases, several options will be used to meet the demands, depending on the specific situation.

Potential implementation strategies for each of the water source options were presented in the previous chapter. This chapter provides recommendations for these strategies to facilitate development of each of the options, both at the regional level (water resource development) and the local level (water supply development). Water

resource development recommendations and water supply development recommendations are presented in separate sections in this chapter.

The funding approach for the UEC Water Supply Plan, as well as potential funding sources for water resource and water supply development recommendations are described in the Funding section of this chapter. The recommendations contained in this Plan are subject to SFWMD Governing Board approval and fiscal budgetary appropriations. As a result, the schedules identified in the Plan are subject to change based on future resource and budgetary constraints. A five-year water resource development work program will be developed following approval of the water supply plans.

Table 21. Potential of Water Source Options in Meeting 2025 UEC Water Supply Needs.

Water Source Option	UEC Water Supply Needs					
	Public Water Supply	Recreational Self-Supply	Agriculture	Thermoelectric Power Generation	Freshwater Needs of Estuarine Systems	Inland Environmental Needs ^c
Aquifer Storage and Recovery	L	L	L	L	L ^d	L
Conservation ^a	L/M	L	L	L	N/A	L
Floridan Aquifer System	H	L	M	H	N/A	H
Reclaimed Water	L	M	L	H	N/A	H
Reservoirs	L	L	M	H	H	L
Seawater ^b	L	L	L	H	N/A	L
Surface Water	L	L	H	L	H	L
Surficial Aquifer System	M	M	L	L	N/A	L

L=Low; M=Medium; H=High; N/A=Not Applicable

- Generally cost-effective and although does not yield volumes comparable to other options, is considered highly effective in contributing to long-term, climate-proof resources.
- Potentially large volume could be made available, but determined not cost-effective at this time.
- Ability of option to reduce demands from SAS, potentially enhancing nearby natural systems.
- ASR was not identified as a component in the recommended CERP Indian River Lagoon – South Project.

WATER RESOURCE DEVELOPMENT RECOMMENDATIONS

Water resource development recommendations are water resource management strategies that are regional in nature and support water supply development at the local level. These could include collection and evaluation of surface water and groundwater data; structural and nonstructural programs to protect and manage water resources; the development of regional water resource implementation programs; the construction, operation and maintenance of major public works facilities to provide for flood control, surface and underground water storage and groundwater recharge augmentation; and related technical assistance to local governments and to government-owned and privately-owned water utilities. Water resource development recommendations are primarily the responsibility of the District.

This section presents the water resource development recommendations for each of the water source options identified in **Chapter 5**. For each water source option, a description, the potential quantity of water that could be made available through that water source option and the water resource development recommendations are provided. For each water resource development recommendation, a description of the recommendation, the quantity of water to be made available, a six-year implementation schedule (Fiscal Year 2005 through 2010), estimated cost, funding source and the implementing agency are provided. The District's fiscal year begins October 1st and ends September 30th. For example, Fiscal Year 2005 (FY 2005) begins October 1, 2004 and ends on September 30, 2005.

Costs include contract dollar estimates, cost of materials and cost-sharing with other agencies; while personnel time estimates, expressed in full-time equivalents (FTEs), represent only District staff time. Dollar costs in tables are stated in 1,000's and do not include the cost of FTEs. Total costs include monies from the District and other agencies, and unless otherwise specified, may be for a time period different than FY 2005 – FY 2010. For example, the Ten Mile Creek Critical Restoration Project has been under development for several years, with construction being initiated in November 2003. The total recommendation cost is \$37,000,000, while the cost for FY 2005 – FY 2010 is \$7,964,000. The entry of N/A denotes not applicable.

Aquifer Storage and Recovery

Aquifer storage and recovery (ASR) is the underground storage of injected water into an acceptable aquifer (typically the Floridan Aquifer System in south Florida) during times when water is available, and the later recovery of this water during high demand periods. The aquifer acts as an underground reservoir for the injected water, reducing water loss to evaporation.

This technology could be used for storage of treated drinking water, partially treated surface water or other treated source. Presently, there are no ASR facilities in the UEC Planning Area. Any water injected must meet all applicable state and federal regulations to ensure public health and safety.

ASR – Quantity of Water Potentially Available

The volume of water that could be made available through ASR wells depends upon several local factors, such as well yield, water availability and variability in water supply and demand. Without additional information, it is not possible to accurately estimate the quantity of water that could be available through ASR. Typical storage volumes for individual wells range from 10 to 500 million gallons per cycle or 31 to 1,535 acre-feet (Pyne, 1995). The volume of water that could be made available by any specific user must be determined through the District's Consumptive Use Permitting (CUP) Program.

ASR – Water Resource Development Recommendations

The following is the water resource development recommendation regarding ASR:

Recommendation 1: The District will provide technical assistance to utilities pursuing aquifer storage and recovery to comply with local, state and federal standards.

Description: Two potential applications of ASR were identified in the UEC Planning Area: drinking water ASR and reclaimed water ASR. For drinking water ASR, utilities whose demands are less than their allocation could store the difference in an ASR system for future use. There are several successful drinking water ASR wells in the District. Reclaimed water ASR was identified as a potential option for reclaimed water storage for utilities that are experiencing seasonal reclaimed water deficits. Aquifer storage and recovery could be used for storage of excess reclaimed water, or for supplemental sources, such as storm water, for later use. There are utilities in the Tampa area that have constructed reclaimed water ASR wells and are operationally testing these systems at this time. There are no reclaimed water ASR wells in the SFWMD.

Each of these ASR applications would have to comply with local, state and federal standards for the protection of public health, safety and welfare.

Potential Elements:

- A. Continue to work with utilities to identify opportunities for drinking water or reclaimed water ASR.
- B. Assist utilities in identifying benefits of ASR.
- C. Identify the potential for District funding assistance, such as the Alternative Water Supply Funding Program, to assist utilities implementing ASR.

Total Recommendation Cost: \$0

Potential Funding Sources: SFWMD

Estimated District Participation: \$0 FTEs: 0.30

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 22. Estimated Schedule and Costs for Promoting ASR.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FTEs	0.05	0.05	0.05	0.05	0.05	0.05	0.30

Conservation

Conservation refers to reductions in water use. Practices and technologies that provide reductions in per capita water uses consist of both long-term, permanent reductions and short-term reductions, which result from temporary behavior changes. Long-term reductions generally result from implementation of technologies, such as ultralow flow plumbing/irrigation devices and water pricing strategies that encourage efficient water use. This is in contrast to short-term water conservation measures and cutbacks made by users during water shortage situations.

Conservation – Quantity of Water Available

With effective implementation of water conservation showerhead, toilet and rain sensor retrofit programs, it is estimated that 11 million gallons per day (MGD) of water could be saved in the urban water use sector of the UEC Planning Area. This assumes 75 percent of eligible characteristic housing stock is retrofitted. In the agricultural sector, over 80 percent of the citrus acreage is currently using microirrigation, a water-efficient technology.

Conservation – Water Resource Development Recommendations

The following are water resource development recommendations regarding conservation:

Recommendation 2: Continue mobile lab presence and expand activity.

Description: Currently there are two urban mobile irrigation labs funded by the District and one agricultural lab funded by U.S. Department of Agriculture – Natural Resources Conservation Service (USDA–NRCS) operating in the UEC Planning Area. The District should continue funding of the urban labs and look for opportunities to expand their activity in the region. This could include local government partnerships funding increased lab services, particularly in newer urban communities.

Potential Elements:

- A. One agricultural MIL.
- B. Two urban MILs.

Total Recommendation Cost: \$2,445,000

Potential Funding Sources: SFWMD, USDA, soil and water conservation districts, and county and local governments

Estimated District Participation: \$696,000 FTEs: 0.60

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 1.02 MGD

Cost per Thousand Gallons: Not available

Table 23. Estimated Schedule and Costs to Continue Mobile Irrigation Lab Activity.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$116	\$116	\$116	\$116	\$116	\$116	\$696
FTEs	0.10	0.10	0.10	0.10	0.10	0.10	0.60

Recommendation 3: Complete rulemaking for Water Conservation.

Description: The District should complete the ongoing rulemaking in Chapter 40E-2 of the Florida Administrative Code (F.A.C.) and *Basis of Review for Water Use Permit Applications* (SFWMD, 1997) regarding water conservation requirements, which will focus on goal-based conservation programs for public water suppliers, and other major water users.

Potential Elements:

- A. Conduct rule development workshops throughout the District.
- B. Conduct rulemaking workshops throughout the District.
- C. Governing Board adopts rules.
- D. Utilize public information and outreach strategies to expand awareness.
- E. Meet with permit applicants as needed.

Total Recommendation Cost: \$10,000

Potential Funding Sources: SFWMD

Estimated District Participation: \$10,000

FTEs: 0.65

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 24. Estimated Schedule and Costs for Completion of Rulemaking for Water Conservation.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$5	\$5	\$0	\$0	\$0	\$10
FTEs	0.00	0.25	0.10	0.10	0.10	0.10	0.65

Recommendation 4: Continue funding of the Water Savings Incentive Program.

Description: The District should continue to fund and enhance the Water Savings Incentive (WaterSIP) Program, to facilitate implementation of cost-effective indoor and outdoor retrofits, such as toilet and showerhead retrofit and rain sensor programs, in the UEC Planning Area, as recommended in this Plan. This cost-share program may benefit public agencies, such as local governments, water utilities or private entities, such as homeowners associations. In past years, the Governing Board has approved funding up to 50 percent of a program's cost, up to \$50,000 for each conservation project.

Potential Elements:

- A. Annually, solicit water conservation proposals from utilities, local governments and large water users via annual workshops at the service center.
- B. Assist utilities in submitting proposals consistent with the UEC Plan recommendations.
- C. Increase outreach and public information efforts on water savings realized from WaterSIP projects in UEC Planning Area.
- D. Complete projects within 12 months.

Total Recommendation Cost: \$5,000,000*

Potential Funding Sources: SFWMD

Estimated District Participation: \$5,000,000* FTEs: 2.00*

Implementing Agency: SFWMD

Quantity of Water to be Made Available: 6.60 MGD* (based on two years of program experience and projected savings as a result of increased funding over time)

Cost per Thousand Gallons: Not available

Table 25. Estimated Schedule and Costs for Continuing Water Savings Incentive Program.*

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$500	\$750	\$750	\$1000	\$1,000	\$1,000	\$5,000
FTEs	0.20	0.20	0.30	0.30	0.50	0.50	2.00

*Districtwide.

Recommendation 5: Expand water conservation outreach and education.

Description: The District, in cooperation with local governments, utilities, large water users and water industry professional organizations, will expand water conservation outreach and education in the UEC Planning Area through District-sponsored workshops, educational materials and funding partnerships, such as Florida Yards and Neighborhoods, MILs and Building Green Workshops.

Potential Elements:

- A. Coordinate project priorities with the District's Department of Public Information and Regional Service Centers.
- B. Develop partnerships with local governments, utilities and other large water users to implement retrofit recommendations.
- C. Implement Outreach/Education recommendations of the Florida Water Conservation Initiative and continually expand awareness of the progress of the Joint Statement of Commitment.
- D. Support efforts of major water users (by industry) to promote best management practices for water conservation by facilitating annual conservation funding workshops.

Total Recommendation Cost: \$2,600,000*

Potential Funding Sources: SFWMD, local governments, utilities, large water users and water industry professional organizations

Estimated District Participation: \$2,600,000* FTEs: 1.30*

Implementing Agency: SFWMD

Quantity of Water to be Made Available: Not available

Cost per Thousand Gallons: Not available

Table 26. Estimated Schedule and Costs for Expanding Water Conservation Outreach and Education.*

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$300	\$300	\$500	\$500	\$500	\$500	\$2,600
FTEs	0.20	0.30	0.20	0.20	0.20	0.20	1.30

*Districtwide.

Floridan Aquifer System

The upper Floridan Aquifer is the principal source of supply to users of the Floridan Aquifer System (FAS) in the planning area. The top of the FAS lies approximately -300 feet National Geodetic Vertical Datum (NGVD) in the northwest corner of the planning area, then dips to the southeast to more than -900 feet NGVD in southeast Martin County. For most of the planning area, the Floridan Aquifer is artesian; the wells flow naturally at land surface without the need for pumps. Water in the FAS is brackish (saline) in the UEC Planning Area. Additional information on the hydrogeology of the FAS in the UEC Planning Area is provided in the *DRAFT Consolidated Water Supply Plan Support Document*.

The upper Floridan Aquifer is used extensively by citrus growers in the UEC Planning Area, primarily as a supplemental irrigation source when surface water availability is limited and as a primary source in areas where no surface water is available. Water from the Floridan is generally blended with surface water or water from the Surficial Aquifer to reduce potential problems associated with salinity. Water quality is critical in maintaining the sustainability of this resource. If the water becomes too salty, excess salinity of irrigation water can result in decreased citrus production/yield, reduction in root growth, and can be fatal to specific root stocks (Syvertsen *et al.* 1989). Construction of storage reservoirs associated with the Comprehensive Everglades Restoration Plan (CERP) Indian River Lagoon – South Project will enhance surface water availability and should reduce the use of the Floridan Aquifer by the citrus industry.

Most of the coastal utilities in the region including Fort Pierce Utilities Authority, Port St. Lucie, Martin County Utilities, South Martin Regional Utility, Plantation Utilities and Sailfish Point currently use water from the Floridan Aquifer as a source of drinking water. A number of smaller private coastal facilities also use water from the Floridan Aquifer as a primary source for potable water. Water from the aquifer is nonpotable throughout the planning area and requires desalination or blending prior to potable use. Utilities in the UEC Planning Area use reverse osmosis (RO) treatment to provide potable quality water. Most of the coastal utilities plan to use water from the Floridan Aquifer to meet increases in potable water demand in their service area.

FAS – Quantity of Water Available

The 1998 Plan analysis indicated the Floridan Aquifer has the potential of supplying, at a minimum, sufficient water to meet all the 2020 projected public water supply demands (64 MGD), while meeting the supplemental water needs (125 MGD) of agricultural users during a 1-in-10 year drought event. This assumes withdrawals will be obtained from existing or proposed wells in agricultural areas, and from wells in proximity of existing Surficial Aquifer wells for public water supply.

FAS – Water Resource Development Recommendations

The following are water resource development recommendations regarding the Floridan Aquifer:

Recommendation 6: Continue to collect data from the comprehensive regional Floridan Aquifer monitoring well network.

Description: The District should continue to collect water level, water quality and water use data from the comprehensive regional Floridan Aquifer network established pursuant to the 1998 UEC Water Supply Plan, including public water supply wells. Data from the network will be used to better understand the relationships between water levels, water quality and water use.

Potential Elements:

- A. Collect and analyze water level, water quality and water use data from network.
- B. Maintain electronic data loggers, flow meters and wellheads.
- C. Prepare reports presenting data and analysis.
- D. Use these data to develop an enhanced computer model of the FAS in time for the next update of this Plan.

Total Recommendation Cost: \$744,000

Potential Funding Sources: SFWMD

Estimated District Participation: \$744,000 FTEs: 2.40

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 27. Estimated Schedule and Costs for Comprehensive Regional Floridan Aquifer Network.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$122	\$122	\$125	\$125	\$125	\$125	\$744
FTEs	0.40	0.40	0.40	0.40	0.40	0.40	2.40

Recommendation 7: Develop a density dependent solute transport groundwater flow model for next UEC Water Supply Plan Update for predictive analysis purposes.

Description: The District will develop and calibrate a density dependent groundwater flow model for the Floridan Aquifer. Hydrogeologic data being collected for the CERP ASR Regional Floridan model will also be used in building this model. The District will use this model to support development of the next update of the UEC Water Supply Plan.

Potential Elements:

- A. Install coastal recorders and sample wells to collect water level and water quality data needed for calibrating this model.
- B. Develop statement of work and select contractor to develop the model.
- C. Develop and calibrate model, and provide documentation for model.
- D. Run calibrated model to simulate different scenarios for next update of UEC Water Supply Plan.
- E. Evaluates model outputs.

Total Recommendation Cost: \$200,000

Potential Funding Sources: SFWMD

Estimated District Participation: \$200,000 FTEs: 2.60

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 28. Estimated Schedule and Costs for Development of Density Dependent Groundwater Model.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$50	\$100	\$50	\$0	\$0	\$0	\$200
FTEs	0.30	0.30	1.00	1.00	0	0	2.60

Recommendation 8: Implement a Floridan Aquifer exploratory well program to gather additional hydrogeologic data for development of a Floridan Aquifer density dependent groundwater model.

Description: The District will implement a Floridan Aquifer exploratory well drilling program to gather Floridan Aquifer hydrogeologic information. There are currently only two sites in the planning area where the District has gained comprehensive knowledge of the FAS. This recommendation incorporates three Floridan Aquifer exploratory well sites in the planning area. The effort involves construction of a multi-zone monitoring well, geophysical logging and aquifer performance testing at each site. Each site will be thoroughly documented and all hydrogeologic data stored in the database.

Potential Elements:

- A. Select drilling sites (3).
- B. Select sites and obtain access agreements.
- C. Develop scope of work and select contractor.
- D. Mobilize drilling site and complete work.
- E. Install recorders on wells, incorporate wells into monitoring network, and conduct sampling quarterly.
- F. Repeat process for second and third sites.
- G. Compile information and prepare report.

Total Recommendation Cost: \$2,250,000

Potential Funding Sources: SFWMD

Estimated District Participation: \$2,250,000 FTEs: 1.40

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 29. Estimated Schedule and Costs for Implementation of Floridan Aquifer Exploratory Well Program.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$750	\$750	\$750	\$0	\$0	\$0	\$2,250
FTEs	0.40	0.40	0.40	0.20	0.00	0.00	1.40

Recommendation 9: Conduct Floridan Aquifer tracer tests to better understand flow paths in Floridan Aquifer.

Description: The District will conduct and document tracer tests in the Floridan Aquifer at two sites. The tracer tests will show preferential flow paths within the aquifer and allow the District to calculate dispersivity for the density dependent model as recommended.

Potential Elements:

- A. Select tracer test sites.
- B. Select contractor to conduct tracer tests.
- C. Evaluate results from tests and prepare a report.

Total Recommendation Cost: \$200,000

Potential Funding Sources: SFWMD

Estimated District Participation: \$200,000 FTEs: 0.70

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 30. Estimated Schedule and Costs for Floridan Aquifer Tracer Tests.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$10	\$70	\$120	\$0	\$0	\$0	\$200
FTEs	0.20	0.20	0.20	0.10	0.00	0.00	0.70

Recommendation 10: Refine Floridan well inventory, increase public awareness of the presence of Floridan wells as land is converted from agricultural use to urban use and support local initiatives to decommission wells that are no longer used.

Description: Through renewal of consumptive use permits in the UEC Planning Area, the District will refine its inventory of Floridan Aquifer wells. The Floridan well inventory will be employed to ensure that Floridan wells are appropriately decommissioned as land used for citrus production (or other agricultural use) is developed into urban uses. Developers will be notified of the presence of Floridan wells on properties through the District's Environmental Resource Permitting (ERP) and/or Consumptive Use Permitting (CUP) Program. The District will provide technical assistance to local Floridan well decommissioning initiatives, including support in securing state and federal funding.

Potential Elements:

- A. Refine Floridan well inventory based on consumptive use permit renewal information.
- B. Provide Floridan well inventory data to the ERP Program.
- C. Educate developers on the location of Floridan wells on properties.
- D. Provide technical assistance and support to local initiatives in securing state and federal funding for decommissioning inactive Floridan wells.

Total Recommendation Cost: \$0

Potential Funding Sources: SFWMD

Estimated District Participation: \$0 FTEs: 0.35

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 31. Estimated Schedule and Costs for Refining Floridan Well Inventory.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FTEs	0.10	0.05	0.05	0.05	0.05	0.05	0.35

Reclaimed Water

Reclaimed water is wastewater that has received at least secondary treatment and is reused after flowing out of a wastewater treatment plant (Chapter 62-610, F.A.C.). Water reuse is the deliberate application of reclaimed water for a beneficial purpose, in compliance with the FDEP and water management district rules. Potential uses of reclaimed water include landscape irrigation, including medians, residential lots, golf courses and other green space, agricultural irrigation, groundwater recharge via percolation ponds, industrial uses, environmental enhancement and fire protection.

Reclaimed Water – Quantity of Water Available

Twenty-seven of the 28 wastewater facilities in the UEC Planning Area with a capacity of 0.10 MGD or greater employ reuse for all or a portion of their disposal. Over 40 percent (8.10 MGD) of the wastewater treated in the planning area in 2003 was reused for a beneficial purpose with 5.43 MGD used for irrigation. In 2002, reclaimed water was used for irrigation of over 5,400 residential lots, 20 golf courses, three parks, five schools and a citrus grove (FDEP, 2002c). About 2.20 MGD was used for groundwater recharge and the remainder was used for industrial and toilet flushing purposes. The results of the analysis indicate that current reuse in the UEC Planning Area, primarily irrigation of golf courses, has contributed to reduce potential resource impacts. It is estimated that wastewater flows will increase to about 40 MGD by 2025—all potentially reusable water.

Reclaimed Water – Water Resource Development Recommendations

The following are water resource development recommendations regarding Reclaimed Water:

Recommendation 11: The District will continue to encourage reclaimed water interconnects between utilities, where appropriate, to maximize the use of reclaimed water.

Description: Interconnections between reclaimed water systems could increase the volume of reclaimed water being used by providing an alternative to deep well injection when wastewater flows exceed reclaimed water demand. By interconnecting reuse systems, reclaimed water could be transferred to an adjoining utility that may be experiencing a deficit of reclaimed water or as reclaimed water storage, stored and retrieved, for use at a later date. For facilities that have minimal reuse capabilities, interconnects with a utility that has these capabilities will make beneficial use of reclaimed water. Reclaimed water interconnects that result in regional benefits should be considered for water resource development funding from the District similar to recommendations in the 1998 Plan.

Potential Elements:

- A. Continue to work with utilities to identify opportunities for reclaimed water interconnects.
- B. Assist utilities in identifying benefits of reclaimed water interconnects.
- C. Identify the potential for District funding assistance, such as the Alternative Water Supply Funding Program and water resource development funds.

Total Recommendation Cost: \$0*

Potential Funding Sources: SFWMD

Estimated District Participation: \$0* FTEs: 0.30

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 32. Estimated Schedule and Costs for Encouraging Reclaimed Water Interconnects.*

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FTEs	0.05	0.05	0.05	0.05	0.05	0.05	0.30

*Potential alternative water supply funding or future water resource development funding to be identified.

Recommendation 12: Modify WaterSIP application criteria to encourage efficient use of reclaimed water.

Description: Utilities are encouraged to become more efficient in the use of reclaimed water. This could include installing meters and establishing volume based rates and/or establishing application rates consistent with District allocation criteria. The District should modify project-scoring criteria for the WaterSIP funding program to give greater emphasis for efficient use of reclaimed water.

Potential Elements:

- A. Modify scoring criteria, as appropriate; to increase scoring for reclaimed water projects involving installation of meters and establishment of volume-based rate structures.
- B. Implement new criteria.

Total Recommendation Cost: \$0

Potential Funding Sources: SFWMD

Estimated District Participation: \$0 FTEs: 0.15

Implementing Agency: SFWMD

Quantity of Water To be Made Available: TBD

Cost per Thousand Gallons: TBD

Table 33. Estimated Schedule and Costs for Revising WaterSIP Scoring Criteria.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FTEs	0.15	0.00	0.00	0.00	0.00	0.00	0.15

Recommendation 13: The District will provide technical assistance to local governments in establishing mandatory reuse zones.

Description: Mandatory reuse zones are geographic areas designated by local governments through ordinance where the use of reclaimed water is required. Mandatory reuse zones are very effective in increasing reuse, especially in undeveloped areas where installation of reclaimed water distribution systems and use of reclaimed water would be required at the time of development for projects located in the zone. It is much more cost-effective to install reclaimed water distribution systems at the time of development compared to retrofitting existing developments.

Potential Elements:

- A. Educate utilities and local governments on the mandatory reuse zone concept.
- B. Provide technical support to entities interested in pursuing mandatory reuse zones, including example ordinances and contacts with entities who have implemented similar mandatory zones.

Total Recommendation Cost: \$0

Potential Funding Sources: SFWMD

Estimated District Participation: \$0 FTEs: 0.35

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 34. Estimated Schedule and Costs for promoting Mandatory Reuse Zones.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FTEs	0.05	0.10	0.05	0.05	0.05	0.05	0.35

Reservoirs

This option involves the capture and storage of excess surface water during rainy periods and subsequent release during drier periods for environmental and human uses. Regionally, surface water storage could be used to attenuate freshwater flows to the St. Lucie River and Estuary, southern Indian River Lagoon and the Northwest Fork or the Loxahatchee River and Estuary during rainy periods and to provide beneficial flows during drier times. In addition, these facilities could increase surface water availability for current and projected uses, and decrease the demand on aquifer systems. However, evaporative and seepage losses need to be considered as these losses could significantly effect water availability.

Reservoirs – Quantity of Water Potentially Available

Reservoirs are considered a management option as these systems allow more efficient use of other sources, such as surface water. The CERP Indian River Lagoon – South Project Implementation Report estimates the project could increase surface water availability by 26,300 acre-feet per year (23.48 MGD). District staff estimate this could result in a decrease of 19 percent in Floridan Aquifer usage for agriculture, further assuring the water needs of the agricultural community.

Reservoirs – Water Resource Development Recommendations

Regional storage through reservoirs is addressed in the Surface Water recommendations of this chapter.

Seawater

This option involves using seawater from the Atlantic Ocean as a raw water source. The ocean (seawater) is an unlimited source of water from a quantitative perspective; however, removal of salts (desalination) is required before potable or irrigation uses are feasible. To accomplish this, a desalination treatment technology would have to be used, such as distillation, reverse osmosis (RO) or electrodialysis reversal (EDR).

Seawater – Quantity of Water Potentially Available

The volume of water available from seawater is unlimited and could meet the needs of this region through the year 2025.

Seawater Recommendations

As part of the UEC 2004 water supply planning process, it was concluded that seawater is a potential alternative source of water, which needs future consideration; however, not in the 2025 planning horizon. Based on the projected water demands, other water sources are available to meet projected needs that have lower treatment costs.

Surface Water

This option involves surface water and surface water related environmental supply strategies to ensure the needs of the environment are met. Strategies include minimum flows and levels (MFLs), water reservations, environmental restoration plans and CERP projects. In the UEC Planning Area, surface water includes direct withdrawal of water from regional surface water sources, primarily the C-23, C-24, C-25 and C-44 canals. Related efforts involve the capture and storage of excess surface water during rainy periods and subsequent release during drier periods for environmental and human uses. Regionally, this includes reservoirs for storage of surface water that could be used to attenuate freshwater flows to the St. Lucie River and Estuary, southern Indian River Lagoon and Northwest Fork of the Loxahatchee River during rainy periods and meet minimum flows during drier periods. In addition, these facilities could increase surface water availability for other uses. In Martin and St. Lucie counties, increased surface water availability could reduce the use of the Floridan Aquifer for agricultural irrigation. This option also includes increasing flexibility in surface water management by connecting surface water basins.

This 2004 Update supports implementation of the CERP to address freshwater regulatory discharges from Lake Okeechobee to the St. Lucie River via the C-44 Canal. The CERP will create more flexibility in the operations of the regional water management system, including storage, additional conveyance systems and improvements to existing conveyance systems, among others. Components of the CERP, such as the Indian River Lagoon – South and Northern Palm Beach County Part 1 projects, located in the UEC Planning Area are itemized in the recommendations. Implementation of the CERP, which is supported from the UEC Planning Area, will not be listed as an individual recommendation in this Plan, as it will be incorporated into the Lower East Coast Regional Water Supply Plan.

Surface Water – Quantity of Water Potentially Available

Surface water from the C-23, C-24, C-25 and C-44 canals is primary surface water sources for agricultural irrigation and inflows to the St. Lucie River and Estuary and southern Indian River Lagoon. The Loxahatchee River receives inflows from the C-18 Canal and several other tributaries. Significant surface water storage will be provided in the future. Development of operating protocols for these storage systems will determine increases in surface water availability. The CERP Indian River Lagoon – South Project Implementation Report estimates the project could increase surface water availability by 26,300 acre-feet per year (23.48 MGD). District staff estimate this could result in a decrease of 19 percent in Floridan Aquifer usage for agriculture, further assuring the water needs of the agricultural community. Water for natural systems from new projects will be reserved from allocation by the SFWMD. The volume of water that may be allocated from the remaining water by any specific user must be determined through the District's CUP Program.

Surface Water – Water Resource Development Recommendations

The following are water resource development recommendations regarding Surface Water:

Recommendation 14: Continue implementation of the Northern Palm Beach County Comprehensive Water Management Plan.

Description: The Northern Palm Beach County Comprehensive Water Management Plan (NPBCCWMP) was accepted by the District's Governing Board in May 2002 and is being implemented. Approximately 44,800 acre-feet of storage has been purchased in the L-8 Reservoir. The G-160 Loxahatchee Slough Structure has been constructed and the G-161 Structure is in design and scheduled for completion in 2005. Improvements to storage and water conveyance infrastructure will capture water currently lost to tide in the wet season and provide supplemental supplies in the dry season—meeting environmental needs and projected urban and agricultural demands for the year 2020.

Potential Elements:

- A. Construct G-161 Structure.
- B. Widen M-Canal.
- C. Replace Control-2 Structure.
- D. Construct L-8 Reservoir.

Total Recommendation Cost: The cost of this project will be determined in the CERP North Palm Beach County Part 1 Project Implementation Report (PIR).

Potential Funding Sources: SFWMD, State of Florida, federal government, local governments

Estimated District Participation: \$ TBD

FTEs: TBD

Implementing Agency: SFWMD

Quantity of Water to be Made Available: TBD

Cost per Thousand Gallons: N/A

Table 35. Estimated Schedule and Costs for Implementation of the Northern Palm Beach County Comprehensive Water Management Plan.*

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FTEs	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Costs and FTEs to be determined in the CERP North Palm Beach County Part 1 PIR.

Recommendation 15: Complete the CERP North Palm Beach County Project Part 1 Project Implementation Report and implement the findings.

Description: The District and U.S. Army Corps of Engineers (USACE) are developing the CERP North Palm Beach County Project Part 1 Project Implementation Report (PIR). This project will serve as a continuation of the NPBCCWMP.

The PIR will document the project elements, cost and schedule, as well as describe the funding sources and implementing agencies. The amount of water that will be reserved for the environment and also made available as water supply will be determined during the PIR process. The CERP North Palm Beach County Project Part 1 is scheduled for completion and operation in 2014 at an initial estimated cost of \$425 million. Local government support and coordination is needed to develop and implement the PIR.

Potential Elements: TBD during PIR

Total Recommendation Cost: \$425,079,000

Potential Funding Sources: SFWMD/USACE

Estimated District Participation: \$212,539,500 FTEs: TBD

Implementing Agency: SFWMD/USACE

Quantity of Water to be Made Available: TBD

Cost per Thousand Gallons: TBD

Table 36. Estimated Schedule and Costs to Complete the CERP North Palm Beach County Project Part 1 Project Implementation Report and Implement the Findings.*

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FTEs	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Elements, phasing of construction, FTEs and costs to be determined in PIR. Project implementation runs through 2014.

Recommendation 16: Develop a restoration plan for the Loxahatchee River.

Description: The District, in cooperation with other agencies and stakeholders, will develop a restoration plan for the Loxahatchee River that incorporates environmental water needs, while maintaining existing levels of flood protection and public water supply. A draft Restoration Plan may be completed at the end of 2004.

Potential Elements:

- A. Summarize available data.
- B. Provide modeling results.
- C. Develop Plan recommendations.

Total Recommendation Cost: \$ TBD

Potential Funding Sources: SFWMD

Estimated District Participation: \$ TBD FTEs: 4.00

Implementing Agency: SFWMD

Quantity of Water to be Made Available: TBD

Cost per Thousand Gallons: TBD

Table 37. Estimated Schedule and Costs for Development of a Restoration Plan for the Loxahatchee River.*

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FTEs	4.00	0.00	0.00	0.00	0.00	0.00	4.00

*Costs and FTEs beyond FY'05 will be identified with development of Restoration Plan.

Recommendation 17: Establish initial reservation for Northwest Fork of the Loxahatchee River.

Description: The MFL rule for the Northwest Fork of the Loxahatchee River states the District intends to adopt an initial reservation to protect existing water used for protection of fish and wildlife, consistent with the restoration goal identified for the Northwest Fork of the Loxahatchee River by 2004. The District initiated rulemaking for the water reservation in April 2004. This water reservation will be reviewed periodically and revised as conditions change, such as the changes that will occur in the region as CERP projects become operational. This provides flexibility to account for changes in implementation strategies and contingency plans during the life of the project.

Potential Elements:

- A. Conduct workshops.
- B. Develop final rule language.
- C. Governing Board adopts rule.

Total Recommendation Cost: \$0

Potential Funding Sources: SFWMD

Estimated District Participation: \$0 FTEs: 1.00

Implementing Agency: SFWMD

Quantity of Water to be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 38. Estimated Schedule and Costs for Establishing Initial Reservation for Northwest Fork of the Loxahatchee River.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FTEs	1.00	0.00	0.00	0.00	0.00	0.00	1.00

Recommendation 18: Review and revise the MFL and associated recovery strategy for the Northwest Fork of the Loxahatchee River by 2005.

Description: By 2005, review and revise, as needed, the existing MFL and associated recovery plan for the Northwest Fork of the Loxahatchee River to consider information developed during the establishment of restoration goals and water reservations pursuant to the MFL rule.

Potential Elements:

- A. Collect/compile data.
- B. Develop revised criteria and documentation, if needed.
- C. Peer review, if needed.
- D. Conduct rule development workshops, if needed.
- E. Conduct rulemaking workshops
- F. Governing Board adopts rules.

Total Recommendation Cost: \$20,000

Potential Funding Sources: SFWMD

Estimated District Participation: \$20,000 FTEs: 2.00

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 39. Estimated Schedule and Costs for Reviewing and Revising the MFL for Northwest Fork of the Loxahatchee River (if needed).

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$20	\$0	\$0	\$0	\$0	\$0	\$20
FTEs	2.00	0.00	0.00	0.00	0.00	0.00	2.00

Recommendation 19: Establish MFLs for the tributaries to the Northwest Fork of the Loxahatchee River.

Description: The District's *MFL Priority Water Body List* (SFWMD, 2004a) identifies the establishment of MFLs for the tributaries to the Northwest Fork of the Loxahatchee River (Cypress Creek, Hobe Grove Ditch, Kitching Creek and Loxahatchee Slough), scheduled for 2007.

Potential Elements:

- A. Collect/compile data.
- B. Develop criteria and documentation.
- C. Peer review.
- D. Conduct rule development workshops.
- E. Conduct rulemaking workshops.
- F. Governing Board adopts rules.

Total Recommendation Cost: \$60,000

Potential Funding Sources: SFWMD

Estimated District Participation: \$60,000 FTEs: 3.75

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 40. Estimated Schedule and Costs to Establish MFLs for the Tributaries to the Northwest Fork of the Loxahatchee River.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$20	\$40	\$0	\$0	\$0	\$60
FTEs	0.00	1.50	2.25	0.00	0.00	0.00	3.75

Recommendation 20: Complete construction of the Ten Mile Creek Project.

Description: After many years of planning and design, construction of the Ten Mile Creek Critical Restoration Project was initiated in November 2003. The project involves construction of a 550-acre reservoir (maximum depth of 10 feet) and a 110-acre stormwater treatment area (maximum depth of 4 feet). This project is located immediately west of the Varn (a.k.a. Gordy Road) Structure on Ten Mile Creek in St. Lucie County and will provide storage and treatment of storm water from the Ten Mile Creek Basin, the largest subbasin discharging into the North Fork of the St. Lucie River. In addition, the Ten Mile Creek Critical Restoration Project will increase surface water availability to agricultural users in the basin.

Potential Elements:

- A. Construction of the project.
- B. Operation of the project.

Total Recommendation Cost: \$37,000,000

Potential Funding Sources: SFWMD, St. Lucie County, State of Florida Grants

Estimated District Participation: \$18,500,000 FTEs: 1.0

Implementing Agency: SFWMD and USACE

Quantity of Water to be Made Available: 6,000 acre-feet of storage provided for the entire project

Cost per Thousand Gallons: N/A

Table 41. Estimated Schedule and Costs for construction of the Ten Mile Creek Critical Restoration Project.*

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$7,894	\$70	\$0	\$0	\$0	\$0	\$7,964
FTEs	0.50	0.50	0.00	0.00	0.00	0.00	1.00

*Large portion of project cost expended in FY'04.

Recommendation 21: Implement the CERP Indian River Lagoon – South Project.

Description: The District should actively pursue federal authorization for the CERP Indian River Lagoon (IRL) – South Project Implementation Report (PIR), and construct the project to manage freshwater flows to the St. Lucie River and southern Indian River Lagoon.

Potential Elements:

- A. Secure authorization of IRL – South Project.
- B. Obtain federal funding appropriation for IRL – South Project.
- C. Construct project.
- D. Operate and maintain project.

Total Recommendation Cost: \$1,200,000,000

Potential Funding Sources: SFWMD, State of Florida, USACE, county governments, USDA–NRCS

Estimated District Participation: \$600,000,000 FTEs: 32.00

Implementing Agency: SFWMD

Quantity of Water to be Made Available: 135,000 acre-feet of storage; 23.48 MGD for human water supply

Cost per Thousand Gallons: N/A

Table 42. Estimated Schedule and Costs for Implementation of CERP Indian River Lagoon – South Project Implementation Report.*

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$136,000	\$190,000	\$173,000	\$24,000	\$4,000	\$1,600	\$528,600
FTEs	5.00	6.00	6.00	6.00	5.00	4.00	32.00

*Portion of project cost expended prior to FY'05.

Recommendation 22: Conduct study of connecting the SFWMD's C-25 Basin with the SJRWMD's C-52 and Upper St. Johns River Basin Project.

Description: This is a cooperative study between the SFWMD and SJRWMD to evaluate the feasibility of connecting the SFWMD's C-25 Basin with the SJRWMD's C-52 and Upper St. Johns River Basin Project. The study would identify the benefits and estimated costs of such a connection.

Potential Elements:

- A. Develop scope of work/services.
- B. Solicit and choose contractor.
- C. Complete study.
- D. Implement recommended course of action.

Total Recommendation Cost: \$100,000

Potential Funding Sources: SFWMD and SJRWMD

Estimated District Participation: \$50,000 FTEs: 0.50

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 43. Estimated Schedule and Costs to Conduct Basin Connection Study.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$50	\$0	\$0	\$0	\$0	\$0	\$50
FTEs	0.50	0.00	0.00	0.00	0.00	0.00	0.50

Surficial Aquifer System

The Surficial Aquifer System (SAS) is the predominant source of water for public water supply and urban irrigation in the UEC Planning Area. The Surficial Aquifer is easily recharged from the surface and is found from land surface to about 200 feet below land surface. Wellfields using the Surficial Aquifer can be limited by the rate of recharge and water movement in the aquifer, environmental impacts, proximity to contamination sources, saltwater intrusion and other existing legal uses in the area.

SAS – Quantity of Water Available

Based on the 1998 Plan analysis and information contained in **Chapter 4**, from a regional perspective, increases in production from the SAS along the coast beyond existing demands appears limited due to potential wetland impacts, and increased potential for saltwater intrusion. However, it was concluded that some further development of the SAS could be accomplished in these areas at the local level through modifications to wellfield configurations and pumping regimes with respect to locations of wetlands and salt water. As a result, additional withdrawals from the SAS in these coastal areas will be evaluated on a project-by-project basis in the planning area. The volume of water that could be withdrawn by any specific user must be determined through the District's CUP Program.

SAS – Water Resource Development Recommendations

The following are water resource development recommendations regarding the SAS:

Recommendation 23: Develop tools in order to conduct SAS modeling that can be incorporated into the next update of the UEC Water Supply Plan.

Description: The District will develop, improve and update modeling tools in order to conduct SAS modeling as part of the next update to this Plan.

Potential Elements:

- A. Review available hydrogeologic and hydrologic data and update database accordingly.
- B. Enhance and recalibrate existing Martin County and St. Lucie County SAS models with new data and technology.
- C. Prepare data sets for base and projected year simulations.
- D. Conduct plan model runs and present results.
- E. Conduct alternative analysis.
- F. Document and conduct peer review.

Total Recommendation Cost: \$300,000

Potential Funding Sources: SFWMD

Estimated District Participation: \$0 FTEs: 4.50

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 44. Estimated Schedule and Costs for SAS Modeling.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$100	\$100	\$100	\$0	\$300
FTEs	0.00	0.00	1.50	1.50	1.50	0.00	4.50

Related Strategies

This section includes those recommendations that apply to several options or could not be associated with a specific option.

Recommendation 24: Coordinate the 2004 UEC Water Supply Plan with other efforts.

Description: Coordinate the 2004 UEC Water Supply Plan recommendations with other regional planning efforts, including development of the Lower East Coast Regional Water Supply Plan, CERP North Palm Beach County Project Part 1, Ten Mile Creek Critical Restoration Project, CERP Indian River Lagoon – South and others.

Potential Elements:

- A. Monitor other efforts.
- B. Actively participate and coordinate UEC Water Supply Plan recommendations with other planning area efforts.

Total Recommendation Cost: \$0

Potential Funding Sources: SFWMD

Estimated District Participation: \$0 FTEs: 1.20

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 45. Estimated Schedule and Costs to Coordinate 2004 UEC Plan with Other Efforts.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FTEs	0.20	0.20	0.20	0.20	0.20	0.20	1.20

Recommendation 25: Ensure the timely coordination of local government land use planning and SFWMD regional water supply planning.

Description: The District will share vital water supply planning information with local governments as it is developed. This information includes, but is not limited to, the projection of anticipated future demands, identification of existing and future sources of available water, sustainability of water resources and natural systems and technical assistance on other related issues, such as water conservation and reuse. The District will provide this information and technical assistance on water supply development issues at the local government level throughout the planning horizon.

Potential Elements:

- A. Assist individual local governments in their efforts to develop 10-year Water Supply Facility Work Plans.
- B. Provide technical assistance to local governments for preparation of water supply related sections of their Evaluation and Appraisal Reports (EARs).
- C. Continue to review and comment on water supply related issues of local government comprehensive plans and associated amendments.
- D. Continue to seek active participation of local governments in regional water supply planning/updating efforts.
- E. Continue to provide funding assistance to local governments in their quest for Alternative Water Supply (AWS) development.

Total Recommendation Cost: \$0

Potential Funding Sources: SFWMD

Estimated District Participation: \$0 FTEs: 2.90

Implementing Agency: SFWMD

Quantity of Water To be Made Available: 0 MGD

Cost per Thousand Gallons: N/A

Table 46. Estimated Schedule and Costs for Coordination of UEC Water Supply Plan with Local Governments.

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FTEs	0.60	0.50	0.50	0.40	0.40	0.50	2.90

Recommendation 26: Continue the Alternative Water Supply Funding Program (Districtwide).

Description: The District will continue the Alternative Water Supply (AWS) Funding Program to facilitate implementation of cost-effective and appropriate alternative water supplies, such as reuse and development of the Floridan Aquifer.

Potential Elements:

- A. Modify criteria to provide more weight to scoring criteria, which incorporate direction of regional water supply plans.
- B. Solicit AWS projects on an annual basis.
- C. Conduct public workshops throughout the District.
- D. Selection Committee to rank approved projects.
- E. Governing Board to determine funding.

Total Recommended Cost: \$27,000,000 (\$4,500,000 per year)*

Potential Funding Sources: SFWMD

Estimated District Participation: \$27,000,000* FTEs: 24.00*

Implementing Agency: SFWMD

Quantity of Water to be Made Available: 300 MGD from FY 2005 through FY 2010*.

Cost per Thousand Gallons: Not available

Table 47. Estimated Schedule and Costs for Alternative Water Supply Funding Program.*

Cost	FY'05	FY'06	FY'07	FY'08	FY'09	FY'10	Total
Dollars (\$1,000)	\$4,500	\$4,500	\$4,500	\$4,500	\$4,500	\$4,500	\$27,000
FTEs	4.00	4.00	4.00	4.00	4.00	4.00	24.00

*Districtwide.

Summary of Water Resource Development Recommendations

Recommendation 1 – *Aquifer Storage and Recovery*: The District will provide technical assistance to utilities pursuing ASR to comply with local, state and federal standards. Aquifer storage and recovery could be used for storage of available water sources for later use.

Recommendation 2 – *Mobile Irrigation Labs*: Continue to fund the existing urban mobile irrigation labs in the UEC Planning Area. There are two urban mobile irrigation labs funded by the District and one agricultural lab funded by USDA–NRCS in the UEC Planning Area. Additionally, the District should look for opportunities to expand urban mobile lab activity. This could include local government partnerships funding increased lab services, particularly in newer urban communities.

Recommendation 3 – *Water Conservation Rulemaking*: The District should complete the ongoing rulemaking in Chapter 40E-2, F.A.C., Basis of Review – Water Conservation Requirements, which will focus on goal-based conservation programs for public water suppliers, and other major water users.

Recommendation 4 – *Water Savings Incentive Program*: The District should continue to fund and enhance the Water Savings Incentive Program to facilitate implementation of cost-effective indoor and outdoor retrofits, such as plumbing and rain sensor programs in the UEC Planning Area. This cost-share program may benefit public agencies, such as local governments, water utilities or private entities, such as homeowners associations.

Recommendation 5 – *Water Conservation Outreach and Education*: The District, in cooperation with local governments, utilities, large water users and water industry professional organizations, should expand water conservation outreach and education through funding partnerships.

Recommendation 6 – *Comprehensive Regional Floridan Aquifer Monitoring Well Network*: The District should continue to collect water level, water quality and water use data from the Comprehensive Regional Floridan Aquifer Network established pursuant to the 1998 UEC Water Supply Plan, including public water supply wells. Data from the network will be used to better understand the relationships between water levels, water quality and water use.

Recommendation 7 – *Floridan Aquifer Density-Dependent Flow Model*: The District will develop and calibrate a density dependent groundwater flow model for the Floridan Aquifer for predictive analysis purposes. This model will be an “inset model” developed from a larger scale regional Floridan Aquifer model. The District will use this model to support development of the next update of the UEC Water Supply Plan.

Recommendation 8 – *Floridan Aquifer Exploratory Well Program*: The District will implement a Floridan Aquifer exploratory well drilling program to gather Floridan Aquifer hydrogeologic information for development of a Floridan Aquifer density dependent groundwater model. This recommendation incorporates three Floridan Aquifer exploratory well sites in the planning area. This includes construction of a multi-zone monitoring well, geophysical logging and aquifer performance testing at each site.

Recommendation 9 – *Floridan Aquifer Tracer Tests*: The District will conduct tracer tests in the Floridan Aquifer at two sites. The tracer tests will show preferential flow paths within the aquifer and allow the District to calculate dispersivity for the density dependent model as recommended.

Recommendation 10 – *Floridan Aquifer Well Inventory*: Through renewal of consumptive use permits in the UEC Planning Area, the District will refine its inventory of Floridan Aquifer wells. The Floridan well inventory will be employed to ensure that Floridan wells are appropriately decommissioned as land is converted from agricultural to urban use. Developers will be notified of the presence of Floridan wells on properties through the District’s Environmental Resource Permitting process and/or Consumptive Use Permitting Program. The District will support local initiatives to decommission wells that are no longer used.

Recommendation 11 – *Reclaimed Water Interconnects*: The District will continue to encourage reclaimed water interconnects between utilities, where appropriate, to maximize the use of reclaimed water. Interconnections between reclaimed water systems could increase the volume of reclaimed water being used by providing an alternative to deep well injection when wastewater flows exceed reclaimed water demand. For facilities that have minimal reuse capabilities, interconnects with a utility that has these capabilities will make beneficial use of reclaimed water.

Recommendation 12 – *Efficient Use of Reclaimed Water*: The District should modify project scoring criteria for the WaterSIP funding program to promote efficient use of reclaimed water. Utilities are encouraged to become more efficient in the use of reclaimed water. This could include installing meters and establishing volume based rates and/or establishing application rates consistent with District allocation criteria.

Recommendation 13 – *Mandatory Reuse Zones*: The District will provide technical assistance to local governments in establishing mandatory reuse zones. Mandatory reuse zones are geographic areas designated by local governments through ordinance where the use of reclaimed water is required. Mandatory reuse zones are very effective in increasing reuse, especially in undeveloped areas where installation of reclaimed water distribution systems and use of reclaimed water would be required at the time of development.

Recommendation 14 – *Northern Palm Beach County Comprehensive Water Management Plan*: Continue implementation of the Northern Palm Beach County Comprehensive Water Management Plan. Approximately 44,800 acre-feet of storage has been purchased in the L-8 Reservoir. The G-160 Loxahatchee Slough Structure has been constructed and the G-161 Structure is in design and scheduled for completion in 2005. Improvements to storage and water conveyance infrastructure will capture water currently lost to tide in the wet season and provide supplemental supplies in the dry season—meeting environmental needs and projected urban and agricultural demands.

Recommendation 15 – *CERP North Palm Beach County Project Part 1*: Complete the CERP North Palm Beach County Project Part 1 Project Implementation Report and implement the findings. This project will serve as a continuation of the Northern Palm Beach County Comprehensive Water Management Plan.

Recommendation 16 – *Loxahatchee River Restoration Plan*: The District, in cooperation with other agencies and stakeholders, will develop a restoration plan for the Loxahatchee River that incorporates environmental water needs, while maintaining existing levels of flood protection and public water supply.

Recommendation 17 – *Initial Reservation for Northwest Fork of Loxahatchee River*: The District intends to adopt an initial reservation to keep existing water used for fish and wildlife protection, consistent with the restoration goal and pursuant to the Minimum Flow and Level (MFL) rule for the Northwest Fork of the Loxahatchee River by 2004. The District initiated rulemaking for the water reservation in April 2004. This water reservation will be reviewed periodically and revised as conditions change, such as the changes that will occur in the region as CERP projects become operational. This provides flexibility to account for changes in implementation strategies and contingency plans during the life of the project.

Recommendation 18 – *Review MFL for Northwest Fork of Loxahatchee*: By 2005, review and revise, as needed, the existing MFL and associated recovery plan for the Northwest Fork of the Loxahatchee River to consider information developed during the establishment of restoration goals and water reservations pursuant to the MFL rule.

Recommendation 19 – *Establish MFLs for Northwest Fork of Loxahatchee River Tributaries*: Establish MFLs for the tributaries to the Northwest Fork of the Loxahatchee River (Cypress Creek, Hobe Grove Ditch, Kitching Creek and Loxahatchee Slough), which are on the District's *MFL Priority Water Body List*.

Recommendation 20 – *Ten Mile Creek*: Complete the construction of the Ten Mile Creek Critical Restoration Project, which was initiated in November 2003. The project involves construction of a 550-acre reservoir (maximum depth of 10 feet) and a 110-acre stormwater treatment area (maximum depth of 4 feet).

Recommendation 21 – CERP Indian River Lagoon – South: The District should actively pursue federal authorization to implement the CERP Indian River Lagoon (IRL) – South Project Implementation Report (PIR), and construct the project to manage freshwater flows to the St. Lucie River and southern Indian River Lagoon.

Recommendation 22 – C-25 to C-52 Basin Connectivity Study: Conduct a cooperative study between the SFWMD and SJRWMD to evaluate the feasibility of connecting the SFWMD’s C-25 Basin with the SJRWMD’s C-52 and Upper St. Johns River Basin Project. The study would identify the benefits and estimated costs of such a connection.

Recommendation 23 – Surficial Aquifer Modeling: The District will develop, improve and update modeling tools in order to conduct SAS modeling as part of the next five-year update of this Plan.

Recommendation 24 – Coordinate UEC Water Supply Plan with Other Efforts: Coordinate the 2004 UEC Water Supply Plan recommendations with other regional planning efforts, including development of the Lower East Coast Regional Water Supply Plan, CERP North Palm Beach County Project Part 1, Ten Mile Creek Critical Restoration Project, CERP Indian River Lagoon – South and others.

Recommendation 25 – Coordinate Land Use and Water Supply Planning: Ensure the timely coordination of local government land use planning and SFWMD regional water supply planning. The District will share vital water supply planning information with local governments as it is developed. This information includes, but is not limited to, the projection of anticipated future demands, identification of existing and future sources of available water, sustainability of water resources and natural systems and technical assistance on other related issues, such as water conservation and reuse.

Recommendation 26 – Alternative Water Supply Program: The District will continue the Alternative Water Supply (AWS) Funding Program to facilitate implementation of cost-effective and appropriate alternative water supplies, such as reuse and development of the Floridan Aquifer.

Table 48. Water Resource Development Recommendations Summary Table.

Recommendation	Plan Implementation Costs (\$1,000 and FTEs)													
	FY'05		FY'06		FY'07		FY'08		FY'09		FY'10		Total	
	\$	FTE	\$	FTE	\$	FTE	\$	FTE	\$	FTE	\$	FTE	\$	FTE
1 Aquifer Storage and Recovery	0	0.05	0	0.05	0	0.05	0	0.05	0	0.05	0	0.05	0	0.30
2 Mobile Irrigation Labs	116	0.10	116	0.10	116	0.10	116	0.10	116	0.10	116	0.10	696	0.60
3 Water Conservation Rulemaking	0	0.00	5	0.25	5	0.10	0	0.10	0	0.10	0	0.10	10	0.65
4 Water Savings Incentive Program*	500	0.20	750	0.20	750	0.30	1,000	0.30	1,000	0.50	1,000	0.50	5,000	2.00
5 Water Conservation Outreach and Education*	300	0.20	300	0.30	500	0.20	500	0.20	500	0.20	500	0.20	2,600	1.30
6 Comprehensive Regional Floridan Aquifer Monitoring Well Network	122	0.40	122	0.40	125	0.40	125	0.40	125	0.40	125	0.40	744	2.40
7 Floridan Aquifer Density-Dependent Flow Model	50	0.30	100	0.30	50	1.00	0	1.00	0	0.00	0	0.00	200	2.60
8 Floridan Aquifer Exploratory Well Program	750	0.40	750	0.40	750	0.40	0	0.20	0	0.00	0	0.00	2,250	1.40
9 Floridan Aquifer Tracer Tests	10	0.20	70	0.20	120	0.20	0	0.10	0	0.00	0	0.00	200	0.70
10 Floridan Aquifer Well Inventory	0	0.10	0	0.05	0	0.05	0	0.05	0	0.05	0	0.05	0	0.35
11 Reclaimed Water Interconnects	0	0.05	0	0.05	0	0.05	0	0.05	0	0.05	0	0.05	0	0.30
12 Efficient Reclaimed Water Use	0	0.15	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.15
13 Mandatory Reuse Zones	0	0.05	0	0.10	0	0.05	0	0.05	0	0.05	0	0.05	0	0.35
14 Northern Palm Beach County Comprehensive Water Management Plan	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Districtwide.

Table 48. Water Resource Development Recommendations Summary Table (Continued).

Recommendation	Plan Implementation Costs (\$1,000 and FTEs)													
	FY'05		FY'06		FY'07		FY'08		FY'09		FY'10		Total	
	\$	FTE	\$	FTE	\$	FTE	\$	FTE	\$	FTE	\$	FTE	\$	FTE
15 CERP North Palm Beach County Project Part 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16 Loxahatchee River Restoration Plan	0	4.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	4.00
17 Initial Reservations NW Fork of Loxahatchee River	0	1.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	1.00
18 NW Fork Loxahatchee River MFL	20	2.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	20	2.00
19 NW Fork Loxahatchee River Tributaries MFLs	0	0.00	20	1.50	40	2.25	0	0.00	0	0.00	0	0.00	60	3.75
20 Ten Mile Creek	7,894	0.50	70	0.50	0	0.00	0	0.00	0	0.00	0	0.00	7,964	1.00
21 CERP Indian River Lagoon – South	136,000	5.00	190,000	6.00	173,000	6.00	24,000	6.00	4,000	5.00	1,600	4.00	528,600	32.00
22 C-25 – C52 Basin Connectivity Study	50	0.50	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	50	0.50
23 Surficial Aquifer Modeling	0	0.00	0	0.00	100	1.50	100	1.50	100	1.50	0	0.00	300	4.50
24 Coordination with Other Efforts	0	0.20	0	0.20	0	0.20	0	0.20	0	0.20	0	0.20	0	1.20
25 Coordinate Land and Water Planning	0	0.60	0	0.50	0	0.50	0	0.40	0	0.40	0	0.50	0	2.90
26 Alternative Water Supply Program*	4,500	4.00	4,500	4.00	4,500	4.00	4,500	4.00	4,500	0.40	4,500	0.40	27,000	24.00
Total	150,312	20.00	196,803	15.10	180,056	17.35	30,341	14.70	10,341	9.00	7,841	6.60	575,694	89.95

*Districtwide.

WATER SUPPLY DEVELOPMENT RECOMMENDATIONS

Water supply development recommendations are water resource management strategies that are local in nature and generally involve the planning, design, construction, operation and maintenance of public or private facilities for water collection, production, treatment, transmission or distribution for sale, resale or end use. Water supply development projects may be eligible for District funding assistance if they meet appropriate criteria. These criteria are explained in the Funding section of this chapter. Water supply development recommendations or water source options are provided for consideration by local governments, water users and utilities.

Aquifer Storage and Recovery

- Utilities should explore ASR, among other options, to extend the use of current resources in order to meet future demands, including addressing peaks in demands or in availability of resources. Aquifer storage and recovery could be used to extend water supplies during peak demand periods.

Conservation

- Local government and utilities should evaluate conservation measures appropriate for their jurisdictional area, and implement cost-effective indoor and outdoor measures. These should include general policy considerations and technology retrofits as described in this Plan.
- Local governments should consider developing and/or enhancing existing Xeriscape™ ordinances to address water- conserving landscape installation for new construction to maximize water savings in initial design and operation of both residential and commercial sites.
- Conversion of the remaining flood-irrigated citrus to microirrigation should continue on a voluntary basis, where appropriate.
- Local governments and utilities should consider continued development and implementation of water conservation public education programs in cooperation with the District.

Floridan Aquifer System

- Landowners with Floridan wells that are not actively used and/or in a state of disrepair should decommission these wells in accordance with appropriate rules and regulations. The citrus industry, as well as others, may want to pursue a state appropriation for funding assistance for a regional approach towards decommissioning Floridan wells.

- Local water users and utilities should consider involving the District in development of their FAS well drilling programs for water supply, ASR and wastewater effluent disposal to collect FAS water quality, water level and hydrologic information that could be used in predictive analysis and development or refinement of a FAS model.

Reclaimed Water

- Local governments should consider adopting building codes and land development regulations requiring proposed projects, exceeding a certain acreage threshold, to construct reclaimed water infrastructure and use reclaimed water when it becomes available.
- Utilities should incorporate water supply considerations in development of reclaimed water programs. In developing reclaimed water programs, utilities should consider the resource efficiency concept of using reclaimed water for wellfield recharge to minimize impacts to the resources.
- Utilities should consider supplemental sources and interconnects with other utilities to maximize the volume of reclaimed water that is reused. Reclaimed water storage should be explored to extend the use of current resources in order to meet future demands, including addressing peaks in demands or in availability of resources.

Reservoirs

- Agricultural operations should incorporate water conservation and water supply considerations in the design of new or retrofitted surface water management systems through best management practices.

Surface Water

There are no surface water supply development recommendations regarding Surface Water.

Surficial Aquifer System

- The potential of using the SAS for new and expanded uses will be evaluated on a project-by-project basis through the District's consumptive use permitting process.
- Water users should consider development of alternative water sources that reduce reliance on the SAS for future demands.

- Utilities performing membrane softening of SAS water should include beneficial use of the concentrate water, such as blending with reclaimed water.

FUNDING

This section addresses the funding strategy and options for implementation of this Water Supply Plan. The approach takes into account the requirements of Chapter 373, F.S., which requires water supply plans to include a funding strategy that is reasonable and sufficient to pay the costs of constructing or implementing all of the water resource development projects.

In general, the funding approach is divided into two major categories: water resource development and water supply development. The water resource development category addresses funding for projects that are primarily the responsibility of the District. Water supply development projects, on the other hand, are primarily the responsibility of local governments, utilities and other water users. However, information is included on programs that target funding of water supply development projects in general.

Water Resource Development

The water resource development projects for the UEC Planning Area were itemized earlier in this chapter. In addition, pursuant to Chapter 373, F.S., each water management district governing board is required to include in its annual budget the amount needed for the fiscal year to implement water resource development projects, as prioritized in its regional water supply plans. In addition to this Plan, the District is also developing updates of the regional water supply plans for the three other planning areas that encompass the District. All updates are scheduled for completion by the end of 2005.

Besides implementation of the water supply plans, the SFWMD is implementing the \$8 billion CERP, a cost-shared effort with the U. S. Army Corps of Engineers (USACE). The recommendation tables in this Plan show the costs of the projects and potential sources of funding. Timeframes for completing the projects are preliminary and are subject to funding availability in the future years.

The traditional funding source for these types of projects has been primarily ad valorem taxes. Non-CERP projects, most of those listed in this Plan, will be ranked and prioritized along with projects in all other regional water supply plans during annual District budget preparation, and funded as money is available. Priority considerations for a project include availability of a cost-share partner and if a project makes “new” water available. Sustainability of the regional system is also an important consideration of project prioritization.

Some of the recommendations in this Plan are studies. These studies may result in construction projects at a later date. Funding associated with these will be addressed at that time. Potential funding sources for water resource development include funds provided on a project-by-project basis through the SFWMD's budget.

Water Supply Development

Chapter 373, F.S. states that, "local governments, regional water supply authorities and government owned and privately owned water utilities take the lead in securing funds for and implementing water supply development projects. Generally, direct beneficiaries of water supply development projects should pay the costs of the projects from which they benefit, and water supply development projects should continue to be paid for through local funding sources." It is not the intent that regional water supply plans mandate actions to be taken by local agencies, utilities and other water users. Therefore, the overall theme of this section is to provide direction and assistance, but not to mandate directives to local governments or utilities.

Chapter 373, F.S. requires water supply plans to identify potential sources of funding for water supply development projects. In addition to funding the projects themselves through utility rates, there are several other funding programs to assist local entities.

District's Alternative Water Supply Funding Program

The District's Alternative Water Supply (AWS) Funding Program is based upon statute adopted by the Florida Legislature in 1995 to increase the potential for the development of alternative water supplies in the state; assist utilities in developing cost-effective reclaimed water supplies; and fulfill a public purpose to fund such programs. Since FY 1997, the District has funded 139 projects Districtwide for a total cost of approximately \$28 million. These projects have created an additional 337 MGD.

The AWS Funding Program is a cost-share program and requires a project's sponsor to provide a portion of the funding for the project. The District publishes guidelines for implementing this program. These guidelines address the application and review process, ranking criteria and the timeframe for implementation.

To be considered for this funding support, the project must be consistent with the local government comprehensive plan and the District's regional water supply plan. The local government must require all appropriate new facilities within the project service area to connect and use the project's alternative water supplies. Funding support shall be applied only for capital or infrastructure costs for the construction of alternative water supply systems and the project must fall within guidelines established by the District.

Projects are scored and ranked by a selection committee of non-SFWMD representatives from utilities, environmental and agricultural interests. They score and rank submitted project proposals based on criteria from the enabling legislation, and the SFWMD. The District's Governing Board approves funding of the selected projects.

Water Savings Incentive Program

In 2002, the District's Governing Board established the District's Water Savings Incentive Program, or WaterSIP, as an initiative to help implement water-efficiency measures that reduce water use demands. Projects eligible for funding under this program are non-capital in nature, meaning not part of a public water provider's or user's capital improvement program. In three years, this program has provided \$700,000 for 19 projects Districtwide. Projects funded included automatic flushing devices, pressure stabilization valves and rain shutoff device incentive programs.

The WaterSIP is a cost-share program and requires a project's sponsor to provide matching funds for the project, unless the project is in an area defined in the rural economic development initiative. The project must be completed within one year. The District publishes guidelines for this funding program annually. These guidelines address the application and review process, ranking criteria and the timeframe for implementation. In the three years the program has been in place, a total of 311 MGY or 852,000 GPD of water has been saved or offset.

Drinking Water State Revolving Fund Program

The Drinking Water State Revolving Fund (SRF) Program is administered by FDEP and provides low-interest loans to eligible entities for planning, designing and constructing public water facilities. Federal and state appropriations fund the SRF. It is a "revolving" fund because loan repayments are used to make additional loans. By federal law, the SRF is to be operated in perpetuity. The FDEP solicits project information each year from January 1 to February 15. The information is used to establish the project priority list for the annual cycle. Funds are made available for pre-construction loans to rate-based public water systems, construction loans of \$75,000 minimum or more and pre-construction grants and construction grants to financially disadvantaged communities. The loan terms include a 20-year (30-year for financially disadvantaged communities) amortization and low-interest rates. Small community assistance is available for communities having populations less than 10,000. Each year 15 percent of the funds are reserved exclusively for their use. In addition, small communities may qualify for loans from the unreserved 85 percent of the funds.

Further information on the Drinking Water SRF is available from:
<http://www.floridadep.org/water/wff/dwsrf/index.htm>.

State Revolving Fund Loan Program for Water Pollution Control

The State Revolving Fund (SRF) Loan Program for Water Pollution Control Program is also administered by FDEP and provides low-interest loans for planning, designing and constructing water pollution control facilities. Federal and state appropriations have funded the SRF. Like the Drinking Water Loan Program, the Water Pollution Control Program is a “revolving” fund because loan repayments are used to make additional loans. By federal law, the SRF is to be operated in perpetuity. The FDEP solicits project information each year. The information is used to establish project priorities for the annual cycle. Funds are made available for preconstruction loans and construction loans. The loan terms include a 20-year amortization and low-interest rates. Preconstruction loans are available to all communities and provide up-front disbursements for administrative services, project planning and project design.

Further information on the Water Pollution Control SRF is available from: <http://www.floridadep.org/water/wff/cwsrf/index.htm>.

RELATIONSHIP OF PROJECTS TO FIVE-YEAR WORK PROGRAM

The District prepares a Five-Year Water Resource Development Work Program annually. This report is submitted to FDEP, and documents the District’s progress in implementing water supply plan recommendations. The timeframe or horizon for the Work Program is a five-year minimum. For each recommendation, the work program provides:

- The cost of the project.
- An estimate of the amount of water to become available by implementing a project.
- Funding source(s).
- Implementing agency(s).
- A summary of any changes to the recommendation since the plan was implemented.
- Timetables.

The recommendations in this Plan will be incorporated into the Five-Year Water Resource Development Work Program following Governing Board approval of the Plan.

REGIONAL WATER SUPPLY PLAN IMPLEMENTATION ASSURANCES

This Plan provides strategies that identify adequate sources of water to meet future urban, agricultural and natural system demands through at least 2025 (Section 373.0361, F.S.). Regional water supply plans include water supply and water resource development components, a funding strategy for water resource development projects, minimum flows and levels (MFLs) established within the planning region, MFL recovery and prevention strategies and technical data and information supporting the Plan.

The water supply development component must include the quantification of the water supply needs for all existing and projected future uses within the planning horizon, with a level of certainty planning goal for meeting those needs during a 1-in-10 year drought event. Furthermore, it must include a list of water source options for water supply development, including traditional and alternative sources, from which local governments, government-owned and privately owned utilities, self-suppliers and others may choose. For each option, the amount of water available, the estimated unit cost of the option and sources of funding must be identified.

Water resource development projects, operational changes, consumptive use permitting and rulemaking associated with the regional water supply plans are proposed to occur in phases throughout the planning horizon. The increasing demands of consumptive users and the environment must, to the extent practicable, correspond with the timing of increased water availability. Where shifts from existing sources of water are required for environmental enhancement, it is crucial that replacement sources are available when such shifts occur.

A composite schedule for implementation of these water resource tools in concert with water resource development projects will be proposed in the regional water supply plans. This schedule will be further refined during the five-year water resource development work plan, five-year water supply plan updates, annual work plans and budget reviews, periodic rule updates and consumptive use permit renewals.

In addition to the regional water supply plans, existing Florida law provides the framework and includes several tools to protect and maintain this phased or incremental consistency between increasing supplies and demands for both consumptive users and the environment. These include water reservations, consumptive use permits, MFL recovery strategies and water shortage declarations. The framework for implementing these tools for providing water user and natural system assurances is discussed next.

Reservations

Reservations of water for the natural system will be established by the SFWMD pursuant to Florida law. Florida law on water reservations, in Section 373.223(4), F.S., provides:

The governing board or the department, by regulation, may reserve from use by permit applicants, water in such locations and quantities, and for such seasons of the year, as in its judgment may be required for the protection of fish and wildlife or the public health and safety. Such reservations shall be subject to periodic review and revision in the light of changed conditions. However, all presently existing legal uses of water shall be protected so long as such use is not contrary to the public interest.

In simple terms, when water is reserved under this statute, it is not available to be allocated for use under a consumptive use permit. Existing allocations under a consumptive use permit are protected to the extent they are “not contrary to the public interest.” Under Florida law, permitted uses and domestic water uses (which are exempt from requirements to obtain a permit) have the legal status of an “existing legal use.” Unauthorized existing uses do not constitute an “existing legal use”.

Reservations are subject to periodic review based on changed conditions. This provides flexibility to account for changes in implementation strategies, restoration objectives and contingency plans during the life of the project.

Consumptive Use Permitting

The water management districts issue consumptive use permits pursuant to Part II of Chapter 373, F.S. In order to obtain a consumptive use permit, the permit applicant must provide reasonable assurances that the use is “reasonable-beneficial”, will not interfere with any presently existing legal use of water and is consistent with the public interest, pursuant to Section 373.223, F.S. The SFWMD implements this three-prong test pursuant to rules adopted in Chapter 40E-2, Florida Administrative Code (F.A.C.). Permits are conditioned to assure that uses are consistent with the overall objectives of Chapter 373, F.S. and are not harmful to the water resources of the area, under Section 373.219, F.S. It is through these statutory provisions, as implemented through District rules, that the District addresses environmental water supply. Specifically, environmental water supply, primarily wetlands and coastal resources, is protected from harm through resource protection criteria implemented through consumptive use permits. These criteria assure wetland hydrology and flow regimes are not harmed as a result of a consumptive use.

For inland wetland systems, water supply is provided for through the use of resource protection criteria that are designed to prevent excessive drawdowns under wetlands that would cause harm to the wetland. Maintaining appropriate wetland hydrology (water levels and hydroperiod) is the single most critical factor in maintaining

a viable wetland ecosystem. Rainfall, along with associated groundwater and surface water inflows, is the primary source of water for the majority of wetlands in the planning areas. See Chapter 2 of the *DRAFT Consolidated Water Supply Plan Support Document* and **Chapter 3** of this Planning Document for additional information on wetland protection and the water supply needs of inland wetland systems. Protection of water supply for estuaries is discussed more specifically next.

Under Florida law, a consumptive use permit provides the permittee with the right to use water consistent with the conditions of the permit for the duration of the permit. Prior to permit expiration, the permittee must obtain a renewal of the permit in order to continue the water use. Florida law also provides specific standards to apply when competition for water occurs, such as when not enough water is available to meet the demands of all pending requests for water use permits under Section 373.233, F.S.

Existing legal uses of water must meet the conditions for issuance of a permit during a 1-in-10 year drought condition, known as the “level of certainty.” This “level of certainty” provides assurance, both to the permitted user and the water resources, which harm will not occur due to permitted withdrawals in climatic conditions less severe than a 1-in-10 year drought.

Minimum Flows and Levels

The SFWMD is responsible for the implementation of statutory provisions in Section 373.042, F.S., requiring establishment of minimum flows and levels (MFLs) for watercourses and aquifers. Generally stated, the MFLs for a given watercourse or aquifer are the limit at which further withdrawals would be significantly harmful to the water resources of the area (Section 373.042, F.S.). Significant harm is defined by SFWMD rule to be the temporary loss of water resource functions that takes more than two years to recover (Rule 40E-8.021(24), F.A.C.). Certain exclusions and considerations for establishing MFLs, including defining “significant harm” for a specific water body, are contained in Section 373.0421, F.S. Recovery and prevention strategies must also be developed if there are existing or projected shortfalls in meeting the MFL, as provided by Section 373.0421, F.S.

Minimum flow and level standards for specific water bodies and aquifers within the SFWMD are contained in Chapter 40E-8, F.A.C., which also includes recovery and prevention strategies for each MFL. At this time, MFLs have been established for the following priority water bodies:

- Lake Okeechobee
- Everglades (Water Conservation Areas, Everglades National Park, Rotenberger and Holey Land Wildlife Management Areas)
- Northern Biscayne Aquifer within the Lower East Coast
- Lower West Coast confined aquifers
- Caloosahatchee Estuary

- Northwest Fork of the Loxahatchee River
- St. Lucie River and Estuary

In addition to the standards and recovery and prevention strategies in Chapter 40E-8, specific consumptive use permitting criteria for MFLs are adopted in Chapter 40E-2, F.A.C. and water shortage criteria for MFLs are adopted in Chapters 40E-21 and 40E-22, F.A.C.

For coastal resources, maintenance of appropriate freshwater inflows is essential for a healthy estuarine system. Flow regimes are typically defined in terms of total mean monthly inflows and a suitable range of acceptable minimum and maximum flow rates. As to maximum flow rates, such excessive changes in freshwater inflows to the estuary result in imbalances beyond the tolerances of estuarine organisms. The retention of water within upland basins for water supply purposes will provide management of inflows into coastal resources found in this planning area. As to minimum flow rates, the District has authority to set MFLs for coastal estuaries under section 373.042, F.S. In 2003, the District established a MFL for the St. Lucie Estuary. This MFL is a part of the process of ultimately achieving restoration of the St. Lucie Estuary through water reservations and associated projects.

In addition, flow regimes for the coastal resources in the UEC Planning Area will be determined with development of restoration plans and operational plans associated with construction of proposed storage facilities in the planning area. See Chapter 2 and Chapter 6 of the Support Document and **Chapter 3** of this Planning Document for additional information regarding water needs of coastal resources in the planning area.

Water Shortage Plan

Pursuant to Section 373.246, F.S., water shortage declarations are designed to prevent serious harm from occurring to water resources. Serious harm is defined by SFWMD rule as long-term, irreversible or permanent impacts to the water resource (Rule 40E-8.021(23), F.A.C.). Declarations of water shortages by the Governing Board are used as a tool to assist in preventing serious harm to the water resources during droughts, while equitably distributing water resources for consumptive and non-consumptive uses, as provided in Chapter 40E-21, F.A.C. Water shortage declarations are imposed in phases, with increasing water use cutbacks with increasing drought conditions.

Comprehensive Everglades Restoration Plan Implementation

The State of Florida and the U.S. Congress have approved implementation of the “*Central and Southern Florida Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement*” for Everglades restoration, known as the Comprehensive Everglades Restoration Plan (CERP). In 1999, the Governor’s Commission for a Sustainable South Florida developed a consensus-based set of recommendations concerning assurances to existing users, including the

natural system (GCFSSF, 1999). These CERP related assurances were adopted into the Commission's *Restudy Plan Report* on January 20, 1999 and incorporated into the CERP. They were also used as the precursor to subsequent laws enacted by the Florida Legislature and Congress in 1999, 2000 and 2001 to provide assurances that implementation of the CERP would not adversely affect water users or natural systems.

These CERP related assurances were developed in the context of the Everglades restoration; however, such assurances are relevant to the implementation of regional water supply plan recommendations throughout the District. As a result, the SFWMD Governing Board directed that implementation of the regional water supply plans be conducted consistent with these directives. The Florida and federal water user and natural system assurance laws regarding the CERP are summarized next.

State of Florida CERP Implementation Laws

The Florida Legislature enacted a series of laws into Chapter 373 defining the roles of the SFWMD and the Florida Department of Environmental Protection (FDEP) in the implementation of the CERP, including Sections 373.026(8), 373.1501, 373.1502 and 373.470, F.S. With regard to assuring project benefits, as with the *Water Resources Development Act of 2000* (WRDA 2000), Section 373.470(b) requires that the comprehensive plan be used as a “guide and framework to ensure that the project components will be implemented to achieve the purposes of the *Federal Water Resources Development Act of 1996*.” (Section 373.470(3)(b)2, F.S.)

Prior to any project component being submitted to Congress for authorization or receipt of an appropriation of State of Florida funds for construction, the FDEP must approve each project component, pursuant to Section 373.026(8), F.S., upon a finding that the SFWMD has complied with the requirements set forth in Section 373.1501(5), F.S. This section provides assurances, including flood protection to natural systems and existing legal users, for each SFWMD project component:

“Analyze and evaluate all needs to be met in a comprehensive manner and consider all applicable water resource issues, including water supply, water quality, flood protection, threatened and endangered species and other natural system and habitat needs;...” (Subsection 373.1501(5)(a), F.S.)

“Consistent with [Chapter 373], the purposes for the Restudy provided in the *Water Resources Development Act of 1996*, and other applicable federal law, provide reasonable assurances that the quantity of water available to existing legal users shall not be diminished by implementation of project components so as to adversely impact existing legal users, that existing levels of service for flood protection will not be diminished outside the geographic area of the project component, and that water management practices will continue to adapt to meet the needs of the restored natural environment.” (Subsection 373.1501(5)(d), F.S.)

Prior to executing a Project Cooperation Agreement (PCA) for each CERP project, the SFWMD must develop a Project Implementation Report (PIR) with the U.S.

Army Corps of Engineers to address the requirements in Section 373.1501, F.S., and to obtain approval under Section 373.026, F.S., for the project from the FDEP. This helps to assure that the PIR will be sufficient to meet both Florida, as well as federal law requirements for implementing a CERP project.

In addition, Section 373.470(3)(c), F.S., requires that each PIR identify the increase in water supplies resulting from a project component. These increased water supplies for the natural system must be allocated or reserved by the SFWMD under Chapter 373, Section 373.470(3)(c), F.S.

Federal CERP Implementation Laws

Congress enacted the *Water Resources Development Act of 2000, Title VI, Comprehensive Everglades Restoration* (WRDA 2000) to approve implementation of the CERP “...as a framework for modifications and operational changes to the Central and Southern Florida (C&SF) Project that are needed to restore, preserve and protect the south Florida ecosystem, while providing for other water-related needs of the region, including water supply and flood protection.” (Section 601(b)(1)(A), WRDA 2000). The WRDA 2000 requires the CERP “...to be implemented to ensure the protection of water quality in, the reduction of the loss of fresh water from, and the improvement of the environment of the south Florida ecosystem and to achieve and maintain the benefits to the natural system and human environment described in the Plan,...” (Section 601(h)(1), WRDA 2000). These provisions are primarily contained in Section 601(h) entitled “*Assurance of Project Benefits*” of WRDA 2000. Some of the most pertinent portions regarding quantification and protection of water supplies from the CERP are summarized next to provide background.

Section 601(h)(2) of the WRDA 2000 requires the execution of a binding agreement between the President and the Governor of Florida to ensure that “the water made available by each project in the Plan shall not be permitted for consumptive use or otherwise made unavailable by the State until such time as sufficient reservations of water for the restoration of the natural system are made under State law in accordance with the project implementation report for that project and consistent with the Plan.” The “*Comprehensive Everglades Restoration Plan Assurance of Project Benefits Agreement*” was executed on January 9, 2002.

Section 601(h)(3) of the WRDA 2000 requires the development of programmatic regulations to establish a process for implementation of the CERP, including in relevant part, procedures for development of PIRs, PCAs, operating manuals, procedures to incorporate new information and adaptive management into CERP implementation, and procedures “to ensure the protection of the natural system consistent with the goals and purposes of the Plan,...” (Section 601(h)(3)(C)(i)(I)-(III), WRDA 2000).

Section 601(h)(4) of the WRDA 2000 identifies requirements for project specific assurances in PIRs, PCAs and operating manuals. Project Implementation Reports, in relevant part, must include identification of quantity, timing and distribution of water for

the natural system and identification of water to be reserved under Florida law. (Section 601(h)(4)(A), WRDA 2000.) Project Cooperation Agreements cannot be executed “until any reservation or allocation of water for the natural system identified in the Project Implementation Report is executed under State law.” (Sec. 601(h)(4)(B)). Operating manuals must be consistent “with the water reservation or allocation for the natural system described in the project implementation report and the project cooperation agreement for the project or group of projects.” (Section 601(h)(4)(C)).

Section 601(h)(5) of the WRDA 2000 provides a savings clause that applies when implementing the CERP. This is a key focus of the federal legislation. It states:

(A) NO ELIMINATION OR TRANSFER – Until a new source of water supply of comparable quantity and quality as that available on the date of enactment of this Act is available to replace the water to be lost as a result of implementation of the Plan, the Secretary and the non-Federal sponsor shall not eliminate or transfer the existing legal source of water including those for—

- (i) an agricultural or urban water supply;
- (ii) allocation or entitlement to the Seminole Indian Tribe of Florida under section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e);
- (iii) the Miccosukee Tribe of Indians of Florida;
- (iv) water supply for Everglades National Park; or
- (v) water supply for fish and wildlife.

(B) MAINTENANCE OF FLOOD PROTECTION – Implementation of the Plan shall not reduce levels of service for flood protection that are—

- (i) in existence on the date of enactment of this Act; and
- (ii) in accordance with applicable law.

(C) NO EFFECT ON TRIBAL COMPACT – Nothing in this section amends, alters, prevents, or otherwise abrogates rights of the Seminole Indian Tribe of Florida under the compact among the Seminole Tribe of Florida, the State and the South Florida Water Management District, defining the scope and use of water rights of the Seminole Tribe of Florida, as codified by section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e). (Section 601(h)(5), WRDA 2000.)